

## **REMARKS**

### **I. Status of the Claims**

Claims 1-14 were originally filed. Claim 14 has been previously cancelled. Claims 1-13 have been rejected. By this amendment, Applicants have amended claims 1 and 4-13 to more particularly point out and distinctly claim what Applicants regard as invention and/or to comply with USPTO rules and regulations. Claim 3 has been cancelled without prejudice. Support for the amendments can be found throughout the as-filed specification. No new matter has been added. Applicants request the prompt reconsideration in view of the amendments and allowance of this application.

### **II. Claim Objections**

The Examiner has objected to claim 1 and claim 4 for typographical errors. Amendments to claim 1 and claim 4 have rendered the objection moot. Applicants respectfully request the objections withdrawn.

### **III. Rejection under 35 U.S.C. § 102(b)**

The Examiner has rejected claim 1 under 35 U.S.C. § 102(b) as allegedly being anticipated by EP 0629015A1 by Faita et al. ("Faita") for reasons of record. See Office Action at 2-3. Applicants disagree.

The fuel cell stack in Faita is of a different configuration, particularly in that it does not have a cooling device as set forth in claim 1, as amended. Faita teaches a fuel cell stack comprising ion-exchange membranes (6), electrodes (7), current collectors (14), metal bipolar plates (1), gaskets (8), end plates (18), and pressure plates (17). See Faita, Fig. 1, Fig. 6, page 6, lines 5-14. Faita also optionally provides an internal duct (5) for the passage of a suitable cooling means. See Fig. 2. It further

describes the location of the internal duct: “The **peripheral frame area of the bipolar plate (1) is provided with** holes (2) and optionally with distribution channels (3) for the inlet and outlet of the gases, holes (4) for the passage of tie-rods (not shown in the figure) and **optionally internal ducts (5) for the passage of a suitable cooling means.**” Faita at page 5, lines 9-11 (emphasis added). It is clear from the description that Faita does not require a cooling device. Optionally, Faita has provided the duct (5) for the passage of the cooling means is inside the peripheral frame of the bipolar plate, as illustrated in Figure 2.

On the other hand, claim 1, as amended, recites: “... each cooling device comprises an electrically conductive spacer and the cooling fluid flows through the cooling device....” Support for this amendment can be found at page 6, line 29 through page 7, line 5 of the as-filed specification. It is abundantly clear Faita does not disclose a cooling device comprising an electrically conductive spacer. Faita’s cooling device, if present, are ducts inside the peripheral frame.

For at least the foregoing reason, Applicants submit that Faita does not teach each and every element in claim 1 and request the rejection withdrawn.

#### **IV. Rejections under 35 U.S.C. § 102(b) and under 35 U.S.C. § 103(a)**

The Examiner has rejected claim 6 under 35 U.S.C. § 102(b) as allegedly anticipated by or, in the alternative, under 35 U.S.C. § 103(a) as allegedly obvious over Faita for reasons of record. See Office Action at 3. Applicants disagree.

As set forth above, Faita does not teach the cooling device recited in claim 1. For at least this reason, Faita also does not anticipate claim 6, which further defines the cooling fluid recited in claim 1. For at least the foregoing reason, Applicants submit that

Faita does not anticipate each and every element in claim 6 and request the rejection withdrawn.

**IV. Rejections under 35 U.S.C. § 103(a)**

**Rejection of claim 2 over Faita in view of Kikuchi et al.**

The Examiner has rejected claim 2 under 35 U.S.C. § 103(a) as allegedly obvious over Faita in view of Kikuchi et al. (US2003/0162078 A1) for reasons of record. See Office Action at 4. Specifically, the Examiner alleges that "Faita discloses the structural components as discussed above in claim 1, but fails to mention a bipolar plate closest to the negative terminal is free of passage holes." *Id.* The Examiner further alleges that "Kikuchi et al. discloses a fuel cell in which there are terminal plates/bipolar plates (34a, 36a) free of openings for only the plate that is closest to each of the ends of the cell." *Id.* Applicants disagree.

Applicants reiterate that Faita does not disclose a fuel cell stack with structural components set forth in claim 1, as amended, for reasons of record. Furthermore, Applicants disagree that Kikuchi fairly discloses or suggests that "the bipolar plate closest to the negative terminal is free of passage openings."

First, plates 34(a) and 34(b) in Kikuchi are terminal plates, not bipolar plates as set forth in the instant claim 2. See Kikuchi at paragraph [0008]. As terminal plates, plates 34(a) and 34(b) are applied to both ends of the fuel cell stack, but are not used to delimit any individual fuel cells in the stack. Bipolar plates, however, are used to delimit individual fuel cells in the stack. Therefore, one of ordinary skill of in the art would not have used the terminal plate in Kikuchi as the bipolar plate in the current invention.

Rejection of claims 4 and 5 over Faita in view of Abd Elhamid et al.

The Examiner has rejected claims 4 and 5 under 35 U.S.C. § 103(a) as allegedly obvious over Faita in view of Abd Elhamid et al (US2005/0267004 A1) ("Abd Elhamid"). See Office Action at 4-5. The Examiner again predicates the rejection on that "Faita discloses the structural components as discussed above in claim 1." Office Action at 4. Applicants submit that Faita does not disclose the structural components as set forth in claim 1, as amended. Thus, Faita and Abd Elhamid combined fail to disclose or suggest all limitation in claims 4 and 5.

Rejection of claims 3, 7 and 8 over Faita in view of Steck et al.

The Examiner has rejected claims 3, 7 and 8 under 35 U.S.C. § 103(a) as allegedly obvious over Faita in view of Steck et al. (US 5,464,700) ("Steck") for reasons of record. See Office Action at 5-6. The rejection of claim 3 is rendered moot by the cancellation of claim 3. Applicants further disagree with the rejection of claim 7 and 8.

Applicants reiterate that the primary reference, Faita, does not teach or suggest the elements of the claimed invention for the reasons of record. In addition, Steck "discloses a Proton Exchange Membrane Fuel Cell (PEMFC) in which gaskets (12, 14) provides physical isolation of membrane (16) (col. 5 lines 23-26) in order to prevent dehydration of the membrane." Office Action at 5. The Examiner further acknowledges that the overlapping of membrane in the gaskets of Steck is for the purpose of preventing leakage of the gases and dehydration of the membrane. *Id.* at 6. On the contrary, the design features as set forth in claims 7 and 8 in fact separate the cooling fluid from the membrane, not to prevent them from dehydration. Therefore, Steck teaches away from the claimed invention.

*Rejection of claims 9-13 over Faita in view of Barton et al.*

The Examiner has rejected claims 9-13 under 35 U.S.C. § 103(a) as allegedly obvious over Faita in view of Barton et al (US 6,423,439) ("Barton"). See Office Action at 7-8. Specifically, the Examiner alleges that "Barton et al. also discloses a membrane electrode assembly in which the ion exchange membrane has integral seals/sealing materials (120') which circumscribe the passage openings/manifolds/holes (105')." Id. at 7-9.

Applicants reiterate that the primary reference, Faita, does not teach or suggest the claimed invention for the reasons of record. Furthermore, Barton only identifies air as the cooling medium. See Fig. 1 and col. 5, lines 9-14. It is not clear from the disclosure whether a liquid coolant can be used. Therefore, one of ordinary skill in the art would not have been suggested to combined the features in Barton, particularly those of sealing elements, with others to arrive at the claimed invention.

For at least the foregoing reasons, Applicants submit that the claimed invention is not obvious over Faita alone or over Faita in combination with other cited references. Applicants request the reconsideration and withdrawal of the rejections.

**IV. Conclusion**

In view of the foregoing amendments and remarks, Applicant respectfully requests reconsideration and reexamination of this application and the timely allowance of the pending claims.

Please grant any extensions of time required to enter this response and charge any additional required fees to our Deposit Account No. 06-0916.

Respectfully submitted,

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